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ABSTRACT

In order to determine whether there was a significant correlation between a student's academic standing in a course and the time when the student withdrew from the course, grades received by students in 14 high withdrawal-rate courses taught by five community college instructors were reviewed. For the purposes of the study, withdrawal was defined as quitting a course prior to term end for which students received grades of W rather than A, B, C, I, or F. Withdrawers were contrasted to dropouts (persons who departed the institution), in that they remained in good standing, academically, and appeared as continuing students (the W grade carried no academic penalty). Findings for the high withdrawal-rate courses indicated that half of all grades assigned were W grades; of these, 55% were given to students who had been doing F or D level work prior to withdrawal. In comparison, only 6% of students completing the courses received F or D grades. The statistical correlation between grade standing and time of withdrawal proved to be significant. It was concluded that for the institution and departments involved in the study, the W grade was being used in lieu of D or F grades. (Author/TR)

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RELATIONSHIP BETWEEN GRADE UPON WITHDRAWAL AND TIME OF WITHDRAWAL, FOR SELECTED COURSES

by

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ABSTRACT

A study was made to determine whether or not there was a significant correlation between a student's academic standing in a course, and the time when the student withdrew from the course. Withdrawal was defined to be the act of quitting a course prior to end of term, and then receiving a grade of W, rather than an A, B, C, D, or F. Students thus withdrawing were labeled as "withdrawers" as contrasted with "dropouts" who were persons who had departed the institution. The withdrawer remained in good standing, academically, and thus appeared as a continuing student, since a W-grade carried no academic penalty. This emerging problem seemed unique to community colleges where up to one-third of assigned grades have become "W" grades.

The researcher found no literature which differentiated the withdrawer from the dropout, the transfer, nor the persister. No studies were found which focused upon the unique category of withdrawer.

Participating instructors recorded week of withdrawal, reason for withdrawal, and academic standing at time of withdrawal, for all students who received a "W" grade. A number of descriptive characteristics were summarized. Then, a Coefficient of Correlation was computed in order to determine whether or not grade at time of withdrawal predicted the week of withdrawal.

In this study of fourteen high W-rate courses, taught by five different community college teachers, the researcher found that half of all grades assigned were W-grades. Of the W-grades, about 55% were assigned to students who were doing F or D level work. By contrast, only 6% of the students who completed the courses received F or D grades. The statistical correlation between grade standing and time of withdrawal proved to be sufficiently high so that the null hypothesis of $R = o$ had to be rejected.

The researcher concluded that for the institution and the departments involved in the study, the W-grade was being used in lieu of D or F grades. It was also concluded that the statistical correlation was not sufficiently strong so as to permit the use of a regression line for prediction.

Recommendations centered upon the need for more study of the withdrawal phenomenon. Such studies were suggested in general, in an attempt to define and categorize the withdrawer. At the institutional level, it was suggested that campus-wide studies be initiated in order to determine whether or not the selected courses in the study, reflected general institutional trends.

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I. TITLE

Relation Between Grade Upon
Withdrawal and Time of Withdrawal,
for Selected Courses.

II. INTRODUCTION

Educational literature abounds in studies of "dropouts" and "dropout rates" at all levels of education. Typically the focus of such studies is to record the percent of dropouts. And also typically, such studies tend to define a "dropout" as being one who is no longer enrolled in a particular institution. Such statistics result in the view that dropouts are non-performers, and even academically deficient. If such were the case, then one might expect to find a relationship between a student's on-going grade standing, and the time of becoming a dropout. Alternatively, if dropping were related to academic standing, then it would seem that drop-outs with higher grades might remain in the course longer.

As an additional refinement, the student who withdraws from one or two classes would not be considered as a college dropout because one or more classes would have been completed. Dropping out of school or staying in school is a clear dichotomy; the students being labeled as "dropouts" and "persisters." But when is a persister not a persister? Just as a transfer student appears as a dropout (no longer enrolled in a particular institution), so too persons who withdraw from classes may appear as persisters (still an on-going student). Thus both transfers and withdrawers are insufficiently differentiated from their parent groups.

Nature of the Problem

Many such withdrawing students may actually withdraw from all classes in a given term and still appear to be continuing students; that is, as persisters and not as dropouts. Furthermore, a student who withdraws from a course may actually have completed the work, but elected not to take a letter grade. Such apparent illogic is the consequence of recent changes in many institutions. If one studies various catalogs for universities, colleges, and community colleges, it becomes apparent

that the old rules are no longer the standard. Instead of limiting the withdrawal time to, say, the first four or six weeks, some institutions have adopted eight or ten weeks. In some cases, a student may withdraw at any time prior to the final exam, and receive a "W" or "no grade" if passing, or an "F" if failing. Similarly, some schools no longer require that sequential courses be taken. While a minimum GPA is required, successive upward progress in a curriculum is not always necessary. Thus, it is no longer valid to make the assumption that students drop a class because they are failing. The question is then raised of the dropout who is not a dropout, and the persister who is not a persister; that is, the continuing student who withdraws from classes and remains in school. Whereas there are numerous studies of dropouts, there is no comparable volume of literature on the student who drops out of classes but remains in school, thus completing little or no course work.

Purpose

One overall purpose of this study was to begin to differentiate between withdrawers and either dropouts or persisters. As one specific effort in that process of differentiation, this study did attempt to determine whether or not the time of withdrawal from a class was related to academic performance in the class. A second purpose was to provide the institution with some initial insight into the W-grade phenomenon by way of certain descriptive data.

Method

In general, the teachers participating in this study recorded week of withdrawal, letter grade standing at time of withdrawal, and reason for withdrawal, for each student who received a "W" grade in a course. Certain descriptive summaries were then compiled. In addition, certain statistical summaries, and a correlation, were also computed. The complete details are provided under PROCEDURES, later in this report.

III. BACKGROUND AND SIGNIFICANCE

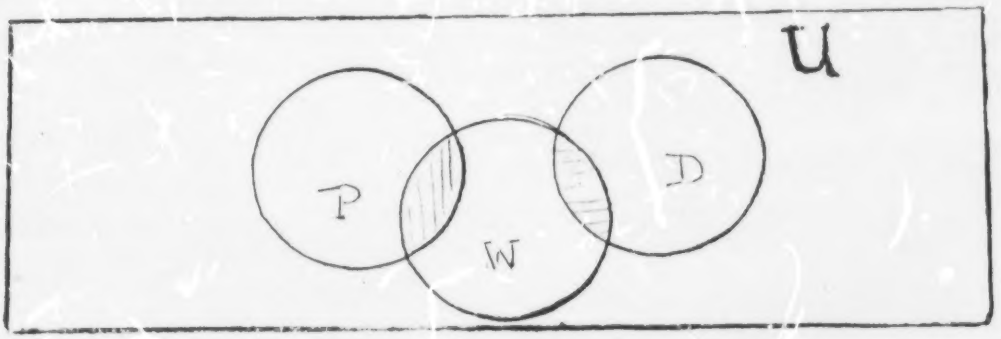
The researcher found no recent literature dealing with a "withdrawer" as differentiated from the continuing student. Likewise, no literature was found relating directly to the study of grade upon withdrawal and time of withdrawal as pertains to "withdrawers" being differentiated from dropouts. The one article which came closest was titled "Concurrent Prediction of Dropout and Grade Upon Withdrawal," published in 1976 [7]. The study was again dealing with dropouts, not withdrawers who remained in school.

Even though no direct parallel study was found, some publications were found to contain related information through the study of dropouts, transfers, persisters, and course completion rates. The latter item, course completion rate, is of principal interest at the institutional level. And the evidence clearly identifies the significance to those institutions. In two such reports [15], [16], the following figures were given:

- between 50% and 80% of students in courses did complete, depending upon the semester and the Department.
- between 70% and 85% of the student-weeks of instruction were completed.
- only between 5% and 10% of students reporting cited the reason for withdrawing as being a dropout from college altogether; a like percent cited failing, or fear of failing, as the reason for withdrawal from the course.

If it is true that between one-fourth and one-third of courses registered into are not completed (i.e., withdrawal from course, not necessarily from college), then, indeed, the figures are of significant interest. Such are the figures reported for California Community Colleges statewide, with some colleges running as high as 50% W-grades.

From the standpoint of State financial aid, the most threatening segment of the withdrawers are those who drop most or all of their courses, but remain in school. They are neither dropouts nor persisters. The withdrawer category then may be seen as a set which includes three sub-sets.



Set of Withdrawers with Three Sub-sets

The withdrawers who were polled in the one limited institutional study [16] had a very low response rate of "failing" when asked the reason for withdrawal. The Encyclopedia of Education reviewed studies of dropouts as far back as 1901. Down through the years, students had a high response rate for "financial difficulties" and a low rate for "failing" when giving reasons for dropping out of school. One might question, historically, if Daniel Schreiber [13] were not right in suggesting that the more frequently given reason might seem to be more "socially acceptable" than citing "failure" in school. In addition, the historical studies were done at the high school level, and so it may not be reasonable to expect to solve one's financial problems by becoming a teen-age school dropout, since over 50% of the unemployed are in that category [5]. By contrast, however, the recent study cited earlier [16], giving a low rate of reasons as being "failing" would well make sense under the modified college grading

trends of the late-60's and the 1970's. Certainly a student would have little fear of receiving a failing grade in an era when SAT scores are falling, but students receive passing grades, and are graduated [6]. There is little reason to fear a failing grade when F's have all but disappeared in high school and college [1]. That being the case, there may indeed be few students who withdraw from a course for fear of receiving a failing grade.

In a study designed to predict high school dropouts based upon sixth-grade records, Dee Herman Lloyd [7] found that academic factors such as achievement test scores and teachers' marks were both consistent and significant factors. Further, Lloyd cited evidence that those same relationships hold from high school into college. Persons with higher academic achievement levels (among 19 other variables) stayed longer in school, and those of lower levels dropped out sooner. The relationship held longitudinally from sixth-grade to high school, and from high school to college. In such a study, though, the student who might drop a single course, would be classified as a long-term student. However, students who were held back (failed a grade, rather than withdraw from classes) were recognized as early dropouts because they showed up as low achievers due to their low grades. Since a student in college can withdraw rather than fail, the withdrawer group still goes as unrecognizable in such studies.

In the Journal of Counseling Psychology, Gail R. Maudal [8] did attempt a better differentiation between dropout and persister by considering the transfer student separately from dropouts. Both the personality and academic factors of the transfer were found to be more alike the persister than like the dropout. The student's GPA was found to be a slightly better predictor than was personality. Likewise, GPA

and a student's plan for continuance in college were found to be significant factors in establishing student satisfaction with academic programs. Such an analysis was done by Morstain [10] but, again, without a differentiation as between persisters, transfers, or withdrawers.

The common thread, then, is that the academic measures are significant factors in prediction of dropout, and in prediction of time of dropout. Such academic measures become overriding factors when involved in studies which consider personality and student satisfaction among dropouts, persisters, and transfers. It remains to be seen whether or not academic standing in a class is related to time of withdrawal from the class in the withdrawer category.

Relationship to Core Module

This Practicum report is being submitted in conjunction with the module on Applied Educational Research and Evaluation. The core module deals with the types of research; selection of proper statistical techniques; and data class. The Practicum being reported here involved:

- both Descriptive and Quasi-experimental design; descriptive in that characteristics such as reason for withdrawal and grades by percent of the total were noted; quasi-experimental in that the Relational test between academic standing and time of withdrawal did involve two Class A variables, neither having been controlled by the researcher; and, of course, neither the classes nor the students were randomly selected since the researcher did use existing classes of a specified type (high W-rate).

Significance to the Institution

This study will aid the institution in differentiating between persisters and withdrawers. Since the number of withdrawals is approaching the number of credit grades in some departments, the institution will want to begin to study withdrawers as a separate category. In addition, individual departments which consistently experience high withdrawal rates may want to evaluate the situation with an eye toward better screening, restating of prerequisites, or changing of teaching techniques. Which of such areas should be first focused upon will be partially answered by knowing whether or not academic standing is related to time of withdrawal for a particular institution or department.

In a broader sense, this study can contribute to the general recognition that withdrawers are a significant and possibly an identifiable group. If such a question can be raised in the minds of other researchers, statewide and nationwide, then an additional contribution will have been made as such researchers begin to identify and to quantify the withdrawer group.

This study can be of greatest significance at the institutional level and the departmental level. As W's become an increasingly larger percent of all grades assigned, the institution will begin to show as being "inefficient" and of a very low "yield" rate relative to other colleges. And statewide, the community colleges will appear to be less effective in the lower division area than competing four-year institutions. At that point, the community colleges will want to be able to show that the problem is being corrected. In the meantime, individual departments and institutions may wish to increase class sizes in order to retain reasonable student-teacher ratios toward the end of the semester in high W-rate classes.

IV. PROCEDURES

The initial procedures which were followed were substantially as presented in the Practicum Proposal. At the end of this PROCEDURES section the subsequent additional procedures will be presented, together with the reasons for such additions.

Following are the initial four procedure steps as presented in the Proposal. The first step was Collecting of Data, followed by Testing of Assumptions, Calculating of the Statistic, and ending with Testing of Significance. In each step, below, a rationale is provided where appropriate, and sources are cited.

Collecting of Data

Class roll sheets were collected from each of five teachers who together taught the fourteen subject classes in the study. All data were collected from those instructors' regular class records. The normal practice was to record the letter grade for each student (A, B, C, D, F, W, CR, NC, I), together with the date of withdrawal for students who received a W-grade.

For purposes of this study, the participating instructors also made two additional entries on their roll sheets for each W-grade assigned. The first additional entry was a Reason for Withdrawal (if known, otherwise UNKNOWN); and the second was Academic Standing at time of withdrawal (A, B, C, D, F). Although only Academic Standing and Week of Withdrawal were actually needed in order to answer the research hypothesis, additional data were collected in order to build a descriptive background about withdrawals. Since the literature search revealed no studies on the withdrawal phenomenon, the researcher felt that any additional data might prove helpful in the future. If nothing else, through this procedure one might ultimately arrive at the point of knowing what additional descriptive data he wished he had collected. Thus, all grades were recorded for all of the students in the classes studied.

The Sample

As stated in the Proposal, all of the W-grades in each of the selected classes were used. The sample of fourteen classes is a selected set of high W-rate classes. The Proposal specifically stated that only high W-rate classes were to be selected from, since there were no studies on the withdrawer category. Therefore, the researcher, of necessity, selected only known high W-rate classes.

Testing Assumptions

The use of parametric statistics involved certain assumptions about the nature of the data. Two such assumptions were not tested (that the 4.0 grading system is an interval scale, and that withdrawer is a differentiatable group). The literature consistently treated the 4.0 scale as being interval, without comment [8]. As concerns the withdrawer category, only the future will verify or deny that assumption. The three remaining assumptions were tested, however. The first was a check for rectilinear, not curvilinear, raw data; the second was to confirm homogeniety of variances; and the third was to verify approximately normal skewness of the distributions.

Rectilinear characteristic of the raw data was tested by preparing a raw data scatter diagram, which is shown in the Appendix. This test, then, was non-quantitative. Once again, though, this technique of observation is frequently cited in the literature, and described in statistical textbooks [3]. The researcher is aware that there is a quantitative procedure [9], which involves comparing the linear correlation coefficient, r, to the curvilinear coefficient (n) by the equation $E = (n^2 - r^2)$. If the data were linear, then the curvilinear fit becomes a first order equation, and $n^2 = r^2$. As the data become increasingly curvilinear, then $n^2 > r^2$, but both n and r are bounded by ± 1.0. Be that as it may, the researcher adopted the typical observation technique as shown in the Appendix. The outcome of this test

procedure will be presented in the RESULTS section of this report.

Testing the assumption of homogeniety variancies involved the F-ratio test [12], as follows:

$$F = \frac{\text{larger variance}}{\text{smaller variance}}$$

$$= \frac{13.89}{1.25}$$

$$= 11.11$$

Reference was then made to a table of F distributions, for the appropriate degrees of freedom. The RESULTS section of this report will present the outcome.

The third assumption tested was that of the skewness of the sample distributions. Skewness was computed by the expression [12], $S_k = \frac{C_{10} + C_{90}}{2}$ - Median; and $E_k = \frac{.5185\ D}{\sqrt{N}}$, where $D = (C_{90} - C_{10})$. The skewness values were computed for the X and the Y distributions, as follows:

Grade upon withdrawal

$$S_x = \frac{C_{10} + C_{90}}{2} - Mx$$

$$= \frac{0 + 3}{2} - 1$$

$$= 1.5 - 1$$

$$S_x = 0.5$$

$$E_x = \frac{.5185\ Dx}{\sqrt{N}}$$

$$= \frac{.5185\ (3-0)}{\sqrt{188}}$$

$$= 1.5555 \ / \ 2\sqrt{47}$$

$$E_x = 0.114$$

Week of withdrawal

$$S_y = \frac{C_{10} + C_{90}}{2} - My$$

$$= \frac{6 + 16}{2} - 10$$

$$= 22/2 - 10$$

$$Sy = 1.0$$

$$E_y = \frac{.5185\ Dy}{\sqrt{N}}$$

$$= \frac{.5185\ (16-6)}{\sqrt{188}}$$

$$= 5.185 \ / \ 2\sqrt{47}$$

$$E_y = 0.378$$

The assumption of near normal distributions (i.e., not excessively skewed) would prove valid were the E_k values to show that the S_k values were not different than the skewness of a normally distributed population by the T-test of $T = \frac{S_k - S_h}{E_k}$, where $S_h = 0.0$. The RESULTS section will present the outcome.

Calculating the Statistic, R

The Pearson Coefficient of Correlation was calculated by the equation, $R = \frac{n(\Sigma x) - (\Sigma x)(\Sigma y)}{\sqrt{n\Sigma x^2 - (\Sigma x)^2}\sqrt{n\Sigma y^2 - (\Sigma y)}}$ and the standard deviation was, $S = \sqrt{\frac{\Sigma(x-\mu)^2}{(N-1)}}$ where μ is the mean. The standard error of R was then calculated as $E_r = \frac{1}{\sqrt{N}}$, for small R, rather than the Fisher Z conversion [12]. The final values were R = 0.240, S_x = 1.11, S_y = 3.72, and E_r = 0.073.

Testing the Significance of R

Finally, the significance of the correlation, R, was determined by the (big) T-test, which is used for large N values, in this case N = 188. The following expression for T applies for N > [illegible] small R values [12].

$$T = \frac{R - h}{E_r}$$

$$= \frac{0.24 - 0}{.073}$$

$$T = 3.29$$

A table of T values was then used to determine the probability, p, for the calculated value of T and for the given value of N. The value of p is the probability that the calculated value of R could have occurred for a random sample of X-Y pairs taken from a normally distributed population of uncorrelated X-Y's. The RESULTS section presents the outcome.

Changed Procedures

The Nova module handbook lists ranges of R, the correlation coefficient, as being the basis of testing the null hypothesis [4]. As elsewhere

stated, the proper null hypothesis should stipulate no significant correlation, at a specified level of confidence (.05 or .01), as a function of N. This participant acquired this realization as a result of the module classes, together with the literature search [12]. The hypothesis was changed to reflect the .05 confidence level.

Additional Procedures

After the Proposed procedures were performed, additional procedures were developed and executed. The reasons which led up to those additional procedures are presented under the appropriate sections of RESULTS and DISCUSSION, later in this report. At this point, only those additional procedures themselves are to be presented.

The additional procedures involved a change from parametric statistical procedures to nonparametric methods. The null hypothesis remained unchanged. However, the Spearman Rank Order Coefficient of Correlation (R_s) was substituted in place of the Pearson Product Moment Coefficient as the statistic with which to test the null hypothesis. Since the Spearman calculation uses data on an ordinal scale, both X and Y data were then assigned ranks. Tied ranks were considered, therefore an average rank was assigned to all scores of the same value.

The Spearman calculation (R_s) is given as follows [14], including the corrections for tied X-scores (ΣTx) and for tied Y-scores (ΣTy):

$$R_s = \frac{\Sigma X^2 + \Sigma y^2 - \Sigma d^2}{2\sqrt{\Sigma x^2 \, \Sigma y^2}}, \quad \text{where} \quad \Sigma x^2 = \frac{N^3-N}{12} - \Sigma t_x, \text{ and } \Sigma y^2 = \frac{N^3-N}{12} - \Sigma t_y.$$

The standard error of Rs was given by the expression: $Es = \frac{1}{\sqrt{N}}$.
Finally, the significance of the correlation coefficient was tested, as before, using the T-test for large N and small Rs values.

$R_s = 0.277$, uncorrected

$R_s = 0.247$, corrected for ties.

$$T = \frac{R_{s-h}}{E_r}$$

$$= \frac{0.247-0}{0.073}$$

$$T = 3.39$$

By entering a T-table, the probability, p, was found. As before, p is the probability of achieving an R_s of 0.247 from a sample of X-Y's chosen from a normally distributed population of uncorrelated X-Y pairs. The outcome of this test is presented in the RESULTS section.

The Hypotheses

There is no positive correlation between academic class standing and time of withdrawal from a course for community college students in selected courses.

1. H_o : (s-h) = 0, the probability is that the sample statistic s (correlation) could have come from an uncorrelated universe, at the .05 level for large N.
2. H_a : s > h, the correlation between X and Y is significant at the .05 level for the value of N.

The null hypothesis states that s, the calculated coefficient of correlation, is not different than the comparable population statistic, h, at the .05 level, for the given value of N, as established by the T-test for large N [12]. If there is no difference between s and h, then the value of s could have come from a sample of X-Y's from a parent population of uncorrelated X-Y's. By contrast, if H_a cannot be rejected, then s is significant at the .05 level for large sample N, and X and Y are correlated; that is, there is a relationship between the grade and the time of withdrawal.

Assumptions

The researcher did utilize the 4.0 grading scale, as defined under Definitions. It was assumed that the 4.0 scale was an interval scale. In doing so, it is recognized that it could also be said that the 4.0 scale is a rank order scale (i.e., ordinal). The assumption was crucial in that the latter argument would mandate nonparametric rather than parametric statistics. In keeping with the assumption that both scales being used (4.0 system, and week number) were interval scales, the researcher then made three related assumptions:

- that a raw data scatter diagram will show rectilinear data,
- that the X and Y variables will meet the test of homogeneity of variances.
- that the distributions are not sharply skewed from normal.

There was an assumption that the category withdrawer would eventually prove to be significantly different from persisters, transfers, and drop-outs. This latter assumption must await further investigations since the category withdrawer has not yet been defined and differentiated in the literature.

Limitations

In general, the study of withdrawers must be limited to community colleges since CC's experience withdrawers in significant numbers. As in the case of the "open door" admission policies, the CC's are uniquely affected by other factors such as large percent of withdrawals. Such is a consequence of the "open door" and the so called "revolving door" policies [2]. If everyone is to have the right to try any course, then it would seem reasonable to provide for a no-penalty tryout. Such is the nature of the W-grade in community colleges.

The findings of this study must be applicable only to the individual institution under study, and even then must be limited to specific departments and courses. Since high W-grade classes must be selected, then any inferences must be limited to those specific courses.

Additional limitations can result from the fact that no differentiations can be made relative to course content, difficulty of material, teaching methods, grading practices among teachers, nor reason for withdrawal.

Definitions of Terms

Throughout this study, the following terms and definitions did prevail:

1. Academic Standing - the equivalent grade level of performance during a course, as contrasted with final grade at end of course completion.
2. Completion - applies only to students who remain in a course, take the final exam, accept a grade in the course, and thereby receive unit credit (contrast to withdrawal).
3. Completion Rate - a figure which gives the proportion of students who completed a course; or may be computed for all students in all courses schoolwide.

$$CR = \frac{\text{\# students who completed course}}{\text{\# students enrolled}}$$

or, $$CR = \frac{\text{\# students completing all of the courses in question}}{\text{\# students enrolled in those courses}}$$

4. Credit Grade - only A, B, C, D, F grades.
5. Drop (dropping a course) - withdrawal from course.
6. Dropout - a person who is no longer enrolled in the institution under study, does not return during the study period.
7. Enrolled - any student whose name appears on a class roll during the fourth week of class. Note: Thereby, persons who signed up for a class but never did attend are excluded; as are persons who quit before the fourth week.
8. Grade (in a course) - a letter grade, issued to each person enrolled, at the end of the term; based upon the 4.0 grade system; may be A, B, C, D, F, I, or W.

9. Grade Upon Withdrawal - the equivalent letter grade-standing at the time a student withdraws. A measure of academic standing which is not part of the official record. All such students receive a W-grade in the course.
10. GPA - Grade Point Average; a weighted average based upon the 4.0 system; computation includes only credit grades.
11. I-Grade - letter grade assigned at end of term for incomplete work which student agrees to complete within one semester in order to receive a credit grade.
12. Persister - a student who was enrolled in the institution under study, and remains so during the study period.
13. Student - any person enrolled in any course in the institution, whether for credit or not; and for no minimum number of units.
14. Student Instructional Weeks - equal to the number of weeks in a term multiplied by the number of students enrolled.
15. Transfer - refers to a person who is continuing school, but not at the original institution.
16. W-Grade - one of six possible final grades; issued only to students who were enrolled, but who withdrew before the end of the term. No unit credit is received, and the grade is not reflected in the GPA.
17. Withdrawal - the process of acquiring a W-grade by filing a form which specifies that the student will not complete the course, and will cease attendance prior to term's end. The student is then no longer officially enrolled in the course, but may continue other courses.
18. Withdrawer - a student who withdraws from a course. Each course is treated independently and hence a student may appear as a withdrawer in one class, while remaining enrolled in another class. Likewise, one student may appear as a withdrawer in more than one course.

V. RESULTS

The following presentation is in the same order as were the steps in the foregoing PROCEDURES section. Each step of that procedure yielded certain results, either descriptive or quantitative. Those results are presented here, and will then be discussed in the following section of this report under IMPLICATIONS.

Results of Data Collection

After the raw data were collected and recorded, they were input to a computer program which then output descriptive summaries in the form of a W-grade Analysis Report. The pertinent descriptive totals are listed below.

5	instructors participated.
14	classes were represented.
377	grades were issued.
188	W-grades were assigned, or 50% of the total.
50%	completed the courses; grades A-F.
B	was the next most frequently assigned grade at 20% of the total, which was 40% of the A-F grades.
D and F	were 6% of the A-F completion grades; F being 4% alone.
6,409	student-weeks of instruction were possible (computed as # students X # weeks in the semester).
4,464	student-weeks of instruction were completed (sum of weeks completed for all students, W-grade or not).
60%	of the W-grades were initiated by the teachers due to non-attendance on the part of the students involved.
40%	of the W's were student initiated.
1/5	of the student initiated W's were with no reason stated.
1/10	of the student initiated withdrawals provided the reason as being work hours conflict, or overload in school. A like proportion gave "not interested, or changed major" as the reason for withdrawal.
45 to 60%	was the overall range of W-rates for the 14 classes involved.

The implications of these results will be discussed later.

Results of Testing the Assumptions

To reiterate, three assumptions were tested in the PROCEDURES section. They were: rectilinear data scatter plot, homogeniety of variances, and normal skewness of the distributions.

The results of the scatter plot can be seen in the Appendix. By observation, the W-grade raw data pattern does not fall into the familiar 45^{o} elipse. Even so, certain resultant patterns are evident from the chart, namely:

1. The scatter plot does not appear to be curvilinear.
2. All points can be enclosed within a trapizoid (the red dashed lines on the chart) which has its base along the Y-axis, and its angular side toward the upper right.
3. The heaviest concentration of data points can be contained within a modified elipse which angles to the upper right (dashed black lines on chart).
4. A-grade performances occur in the last half of the semester.
5. B-level grades fall at the midterm or later.
6. Most C and D-level points are in the weeks #6 and beyond.
7. The F-level of performance is distributed across the semester, from week 4 on.

The key result here is that the data are not curvilinear. The first of these three assumptions was therefore justified.

The F-ratio test of the assumption of homogeniety of variances yielded a value of F = 11.11. The table of F- distributions showed that such a value of F is substantially larger (about 10 times) than would be expected for distributions of like variances, for the given degrees of freedom. As a result, the hypothesis that there is no difference between the variances, must be rejected. In fact, it can be rejected with confidence, beyond the .01 level. Consequently, the assumption of homogeniety of variances was

not justified. Since such an assumption is embodied in the use of parametric statistics, then a discussion is called for, and will be presented in the next section of this report.

The test of the assumption of near-normal skewness gave the values of 0.5 skewness in X, and 1.0 in Y. The corresponding standard errors were Ex = 0.114 and Ey = 0.378 respectively. The calculation for the T-tests gave the results of T_x = 4.37 and Ty = 2.65. The T-table for large N samples gave the probabilities, $p_x < 0.0013$ and $p_y = 0.0040$. A p value represents the probability that the calculated skewness is actually equal to zero. That is, the sample distribution is near normal. The test hypothesis is that Sk = 0. The probability of that is .0013 for X and .0040 for Y. Therefore, the result is that there is little probability that X and Y have a near normal skewness. The hypothesis that the skewness is like that of a normal distribution must be rejected, and hence the assumption of near-normal skewness was not justified. Discussion on this point will follow in section VII of this report.

Results of the Statistical Calculations, R and Significance

The Pearson Coefficient of Correlation was computed to be R = 0.240. For the large value of N = 188, then the value of T was 3.29. The T-table for large samples gave a probability value of p < 0.00135. The test hypothesis here is that R = 0; or put another way, there is no difference between the sample R and the R of a normal population of uncorrelated X-Y pairs. Such a normal population would of course show a correlation of zero. The result was that the probability that R = 0 was so very small that the test hypothesis could be rejected with confidence. In doing so, the researcher could be wrong only about one time in a thousand.

The net results then reduce to the following:

1. The assumption of homogeniety of variances between Grade and Week of withdrawal was not appropriate for these data.
2. The assumptions of near normal skewness among Grades at time of withdrawal, and for the Week of withdrawal, were not justified.
3. The Pearson correlation of R = 0.240, the value itself, cannot be discarded as being effectively zero for the large value of N = 188.
4. The alternative hypothesis that there was a correlation between X and Y, that is $R \neq 0$, could not be confidently rejected.

The above results meant that the research hypothesis (that there is no correlation between Grade, and Week of withdrawal) was rejected relative to the selected high W-rate classes. Discussions will follow in part VII.

Results of Additional Procedures

The Spearman Rank correlation coefficient was $R_s = 0.247$, corrected for ties. T was 3.39, giving a T-table value of $p < 0.00135$. Once again, the test hypothesis was that Rs = 0, or, that Rs was a chance occurrence. Since the probability of such a chance event is so low, the test hypothesis can be rejected with the confidence that it would only occur about one time in a thousand. Once again, the Ho can be rejected, but Ha cannot be rejected because of the high probability that $Rs \neq 0$.

Before leaving the results section and moving to DISCUSSIONS, one final point should be made. All of the statistical calculations used the one-tailed test for significance. The rationale for a one-tail, rather than a two-tail test, rests on the researcher's interest in a positive correlation between the variables. Such a rationale can be found from a number of authorities [12]. At any rate, no difference in results would have occurred if a two-tail test had been used, since the p values were so very small.

VI. DISCUSSION, IMPLICATIONS, AND RECOMMENDATIONS

The reader should recall that this study involved a selected group of high W-rate classes. Therefore, all discussions, implications and conclusions are relative to those specific classes and departments represented in the sample. Further, due to the lack of literature on the withdrawer category, the researcher included certain descriptive data in search of definite characteristics and trends. The following presentation, then, will be divided into two discussions; that of the descriptive results, and that of the statistical results.

Discussion of Descriptive Results

Under the RESULTS section of this report, the Data Collection phase provided considerable descriptive results. The researcher first noted that those descriptive results are in keeping with the results in the 1971 [15] and the 1975 [16] reports, for the same departments. The fourteen classes represented in this study accurately reflect the four departments from which they came, with respect to grade distributions and W-rates [15]. The 1971, 1975, and 1977 studies show decided trends for the classes and the departments represented. They are:

1. The classes and departments represented in the studies have higher W-rates than does the college at large; about twice the college-wide W-rate.
2. The classes and departments represented here have experienced a continued increase in the W-rates from 1971 to 1975, and into 1977. The W-rate moved from the 39-40% range in '71, to the 45% figure in '75, and then 50% or over in 1977.

A visual examination of the scatter diagram in the Appendix is rather revealing. No A-level withdrawals occurred before midterm; all B-levels occurred in the last two-thirds of the semester. F-level withdrawals came throughout the term. Another comparison worth comment is that while the F-level represents only 4% of the A-F completed grades, one-third of the W-students were actually failing. Grades of F and D together comprise 6% of the completed A-F group, whereas 54% of the withdrawals were for D or F students.

Again, reviewing the RESULTS section, one should note that 60% of the W's were initiated by the instructors due to student absence. Thus, most W-grades occur because the students do not return to class; they simply do not come back, not even to withdraw. For the institution under study, there are no administrative rules which impose an obligation upon the student to withdraw. There is, however, a policy that requires the instructor to assign a W-grade if the withdrawal occurs prior to the eleventh week of class, and regardless of actual academic performance [19]. By that policy, then, two-thirds of the F-level W-grades are mandated by administrative rules. The remaining F-level performers were assigned W-grades at the option of the instructor. Regardless of the administrative/instructor W-rules, the fact remains that about one-third of the total enrollments, and some 60% of the withdrawals in this study, resulted in a teacher assigned W-grade because the student failed to return to class. This study then shows the withdrawers as being characterized as non-participants, at least in individual classes; a sort of academic AWOL group.

Discussion of Statistical Results

The initially proposed procedures yielded a Pearson R of 0.240, which was statistically significant for large N. However, it should be recalled

that the assumptions about the variance and about the skewness were not valid for the data used here. The researcher then posed two questions. First came the question of the practical significance of an R of only 0.240, even though it be statistically significant. Second was the question of the statistical meaning of any R value, when the underlying assumptions have been shown to be unwarranted.

The first consideration is of the practical value of an R = 0.240. The potential value of any statistical correlation lies in the possibility of defining a regression line, or curve, to be used for predictive purposes. An R of only 0.240 does not offer much predictive value. A practically useful R value would be in the range of about twice the 0.240 obtained here, or more [4].

The second question, that of the failing the assumptions underlying parametric statistics, leads to a more involved discussion. The skewness of the grade levels of W-students, and the skewness of the week of withdrawals, are worth considering. The heavy bias toward D's and F's among the withdrawers has already been noted and discussed. The second chart in the Appendix, showing numbers of students remaining in classes, represents the Y data. The fact that the graph is almost a straight line shows that withdrawals occur generally and continuously throughout the term. The bulk of withdrawals do not occur during the middle weeks, with the very few toward beginning and end. For instance, either eight or nine withdrawals occurred in each of the weeks five, eleven, and seventeen. Similarly, between seventeen and twenty-three withdrawals were recorded in weeks six, seven, nine, ten, thirteen, and sixteen - hardly a distribution resembling normal. In fact this distribution is rather flat, and consequently the variance in Y was very large compared to X (an 11:1 ratio). Thus, the homogeniety of variance test failed.

The contracted A-F grading scale contributed to the failure of the variance test also. Over half of the W-grades are concentrated at the D and F levels. By contrast, the A-F completion grades are concentrated between A, B, and C; and predominately at the A and B levels. At this point in the discussion, the researcher faced the crucial second question: Is the 4.0 grading scale truly an interval scale?

Without turning this report into a philosophical discussion of grading scales, the literature provides clear evidence that the unchallenged assumption that the A-F grading scale is interval, must be reexamined [1]. For certain, one cannot say that the difference between, say "A" and "B," is the same as is the difference between "C" and "D." And where does "W" fit on such a scale, when some one-third of all students receive a W-grade for "D" and "F" performances? Both the literature, and this very study, would seem to show that the A-F grading scale has substantially collapsed into an A-C scale, if not an A-B scale. The contraction is so severe that at some universities (e.g., University of California at Santa Barbara) the 4.0 scale has given way to the 4.3 system. On the new scale, letter grades are assigned with plus or minus signs, or no sign. In that manner [18], the scale is A+, A, A-, B+, B, B-, and so forth; where A+ is 4.3, A is 4.0, continuing to 0.0 for F-. Such a scale would seem to be an admission that the old A-F scale has so contracted to the upper end that it provides no differentiation, and hence, it is no scale at all.

The researcher had no intent to prove or disprove any thesis concerning the 4.0 grading scale. From a practical standpoint, though, the more thought and the more reading on the subject has led this writer to a reversal in thinking. This researcher was no longer willing to make the necessary assumption that the A-F grading scale was interval. The more one reads of grade escalation [1], falling SAT scores [6], under-employment

and functional illiteracy [5], then the less certain is any assumption concerning the grading scale.

As stated in the PROCEDURES section, the researcher reversed the prior assumption concerning the A-F interval scale, and assumed it to be merely ordinal. The Additional Procedures have been described, and the Results of those procedures have been presented. The preceding paragraphs discuss the rationale for reverting to nonparametric methods. At any rate, the Spearman coefficient of $R_s = 0.247$ was sufficiently large that the null hypothesis (of no correlation) could be confidently rejected. The T-test had provided a probability sufficiently large that the alternative hypothesis (that there was a correlation) could not be rejected.

This report has already presented a discussion of the practical usefulness of a low R value. Since the Rs value was not substantially greater than R, then the foregoing discussion will be left to stand relative to Rs as well.

Conclusions

The researcher drew the following conclusions:

Descriptive:

1. Most W-grades are assigned to failing students who are absent.
2. Instructors assign W's in lieu of D's and F's.
3. Administrative practices encourage instructors to assign W's; and promote a lack of accountability on the part of students.
4. The W-grade therefore offers comfort to everyone; students don't fail, teachers need not make painful grading decisions, and administratively the enrollments remain high, which maintains a high level of state financial support.

5. The withdrawers in this study exhibited the traits of the dropouts as noted by Schreiber [13]. More "socially acceptable" reasons were cited as reasons for withdrawing, whereas most withdrawers were actually failing.

Statistical:

1. The Spearman calculation showed Grade and Week of withdrawal to be statistically related, though slightly so.
2. The withdrawers in this study appear alike the dropouts in the literature. Each of those two categories show a relationship between academic performance and time of departure [7].
3. The relationship between X and Y in this study was not sufficiently strong to provide an instrument for prediction.

Implications

The fact that the W-rate is high, and rising, in the departments and in the classes studied here, should be of major concern. In addition, the trends represented by these classes were reflected college wide in 1971 and 1975, and again here in 1977. Although the institution's W-rates were lower than those of this study, the fact remains that these classes typified their departmental figures; and those departments have been a bellwether of W-trends for this institution in the past. The implications of the above accumulated facts are simply that the W-rate can be expected to increase further.

There is a noteworthy implication relative to personal development, and individual responsibility. The comfortable arrangement relative to W-grades hardly represents good training, nor responsibility. The teachers and the administrators can ignore a waste factor of between one-third and one-half of enrollments. The withdrawers need never face the reality

of their role, since it is not even necessary to admit to withdrawal by personally acting to file a withdrawal. Such would seem to imply irresponsibility by mutual agreement and assistance.

The most severe implication stems from the lack of data, and the lack of studies in the literature, on withdrawals. Such a lack means that corrections are not possible simply because recognition has not yet occurred. One could ask a gross of research questions about the withdrawal phenomenon, but none could be answered, for lack of data. Even the Education Index provides no recognition. The entry under "withdrawal" provides the reference "see dropout." The ERIC Thesaurus of Descriptors similarly uses withdrawal to mean dropout.

Recommendations

The following recommendations involve educational research in general, as well as the particular institution and the specific departments represented in this study.

General:

1. Replicate some of the better studies [8] on Dropouts, using Withdrawers; including comparative studies.
2. Perform studies [11] which will differentiate the Withdrawer category.

Institutional:

1. Perform a descriptive study on W-grades: percent of W's by department; by teacher; by student. Determine whether high W-rate classes relate to subject matter or not.
2. Replicate this study campus wide to see whether or not the descriptive and statistical trends hold throughout the institution.
3. Repeat this study, but including the additional variables of examination weeks, and assignment due dates.

4. Alter the W-grade policy so as to require individual student action by filing a withdrawal notice, so that data can begin to be collected at the time of withdrawal.

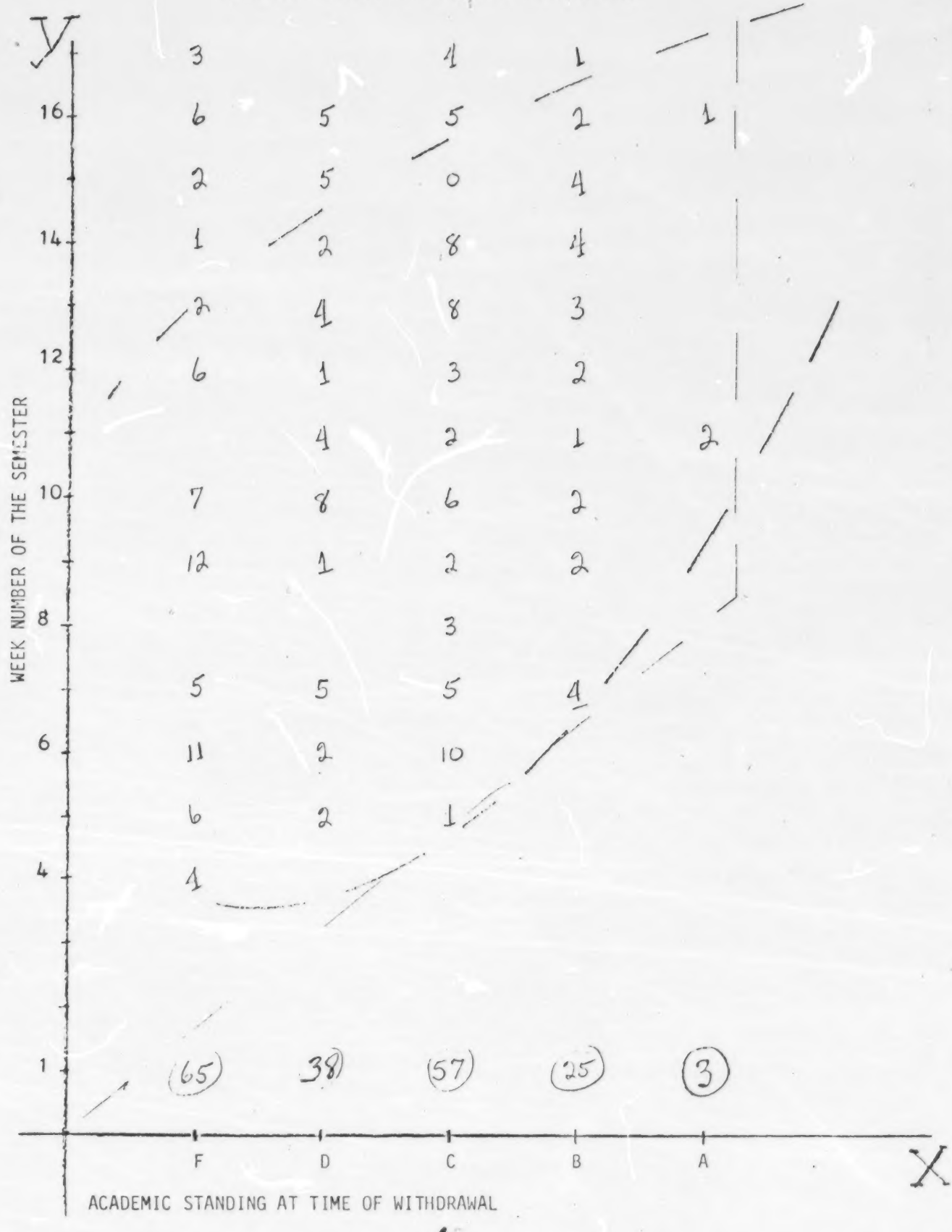
Departmental:

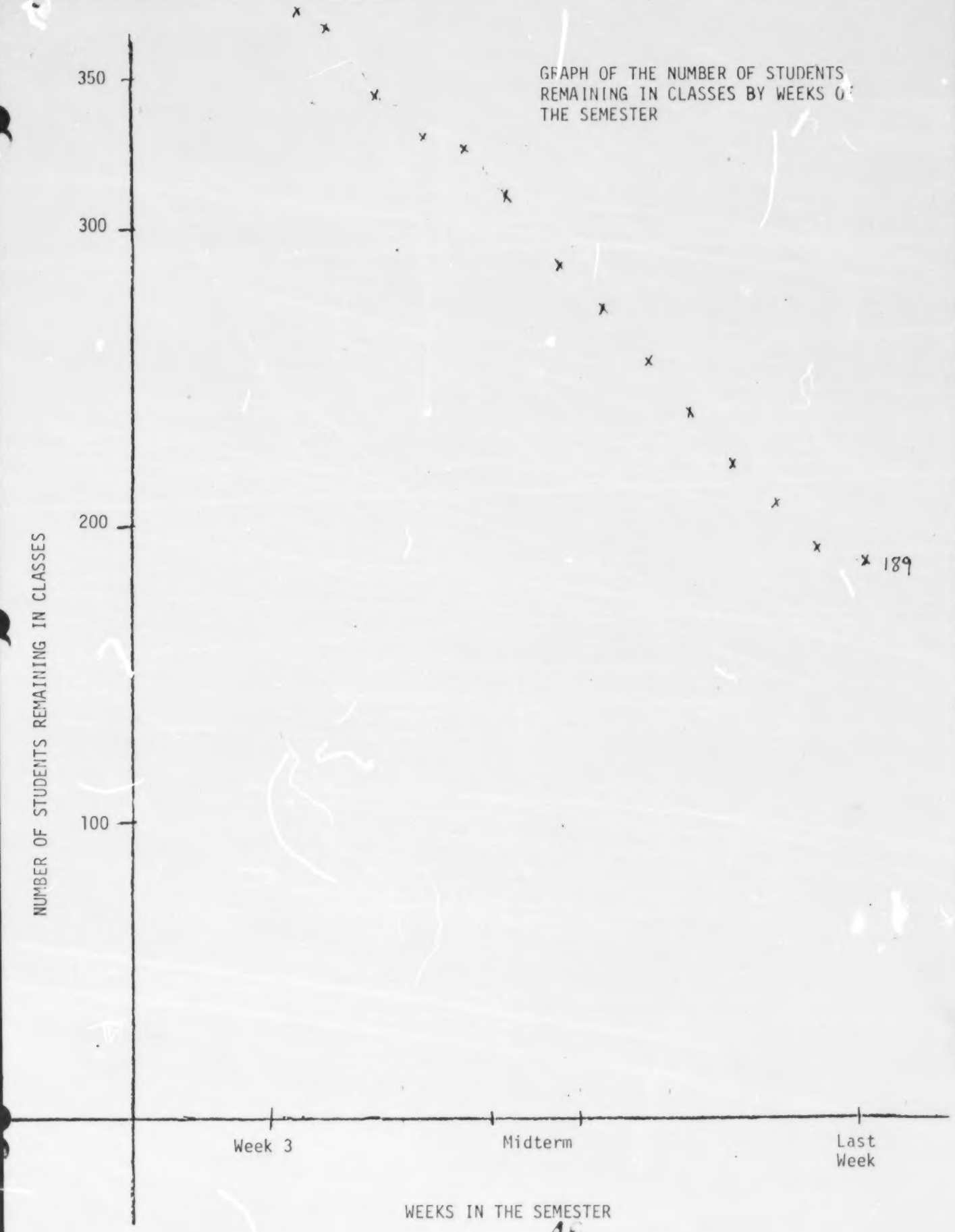
1. Evaluate high W-rate courses relative to course content, texts, teaching methods, levels of instruction, and reasons for the high rates of nonattendance.
2. Determine whether or not high W-rate departments use different attendance standards than do other departments.
3. Perform a survey, and a follow-up interview, of withdrawers in an attempt to confirm causes of withdrawals.

VII. APPENDIX

1. Scatter Plot of W-grade Data
2. Graph of Number of Students Remaining in Class

SCATTER PLOT OF W-GRADE DATA
SHOWING NUMBERS OF STUDENTS WITHDRAWING




GRAPH OF THE NUMBER OF STUDENTS REMAINING IN CLASSES BY WEEKS OF THE SEMESTER
350
300
200
100
189
NUMBER OF STUDENTS REMAINING IN CLASSES
Week 3
Midterm
Last Week
WEEKS IN THE SEMESTER

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